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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/741,672

12/19/2000

Bart Buijsse

PHQ 99-015

7057

7590

11/04/2004

Jack E. Haken
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EXAMINER

YUN, JURIE

ART UNIT

PAPER NUMBER

2882

DATE MAILED: 11/04/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/741,672

Applicant(s)

BUIJSSE, BART

Examiner

Jurie Yun

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 August 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 December 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. The amendment filed 8/18/04 has been entered, and the objection to claim 5 has been withdrawn.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-3 and 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang (USPN 5,044,001) in view of Smither et al. (USPN 4,953,191).
4. With respect to claims 1, 2, and 6-8, Wang discloses an X-ray microscope (Figs. 1 & 2) which includes a device for generating X-rays (16), which device is provided with means for forming a focused radiation beam whose focus is situated on the target (12), said focused radiation beam comprising a beam of electrically charged particles (9), wherein the beam of electrically charged particles comprises an electron beam. Wang also discloses the x-ray microscope being a scanning x-ray microscope (Fig. 2).

Wang discloses all the elements except that the focus of the focused radiation beam is situated on a fluid jet. Smither et al. disclose the focus of the focused radiation beam (Fig. 1, 18) is situated on a fluid jet (16), and that use of a solid target is known to result in a lot of maintenance problems and machine downtime due to debris and problems associated with heating/cooling of the target (Smither et al. column 1, lines 13+). It would have been obvious to one of ordinary skill in the art at the time the

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invention was made to use the teaching of a fluid jet in the Wang X-ray microscope, to replace the metal foil used by Wang, to produce X-rays, because this would help eliminate the problems associated with using a solid target.

5. With respect to claim 3, Smither et al. disclose the cross-section of the fluid jet (16) in the direction of the focused beam (18) is smaller than that in the direction transversely thereof. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the cross-section of the fluid jet in the direction of the focused beam be smaller than that in the direction transversely thereof, to produce a point source, which is desired in X-ray microscopes.

6. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wang (USPN 5,044,001) in view of Smither et al. (USPN 4,953,191), as applied to claim 1 above, and further in view of Berglund et al. ("Cryogenic liquid-jet target for debris-free laser-plasma soft X-ray generation" published in Rev. Sci. Instrum. 69, p. 2361, 1998).

7. With respect to claim 4, Smither et al. do not disclose the fluid jet consists essentially of liquid oxygen or nitrogen. Berglund et al. disclose the use of liquid nitrogen as the target material for soft x-ray microscopy. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use liquid nitrogen as the target material in the Wang X-ray microscope, because, as taught by Berglund et al., liquid nitrogen provides a debris-free source of X-rays, which would help prevent machine downtime due to maintenance.

8. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wang (USPN 5,044,001) in view of Smither et al. (USPN 4,953,191), as applied to claim 1 above, and further in view of Iketaki et al. (USPN 5,835,262).

9. With respect to claim 5, Wang discloses the means for producing a focused beam of electrically charged particles (9) comprises an electron gun (3) for a cathode ray tube. Wang does not disclose the X-ray microscope includes a condenser lens disposed between the fluid jet and an object to be imaged by means of the X-ray microscope. Iketaki et al. disclose a condenser lens (Fig. 7, 24) which is arranged between the target (23) and the object (27) to be imaged by means of the X-ray microscope. It would have been obvious to one of ordinary skill in the art at the time the invention was made to further modify the Wang X-ray microscope to include a condenser lens arranged between the fluid jet and the object to be imaged, to obtain better imaging of the transmission X-rays.

Response to Arguments

10. Applicant's arguments filed 8/18/04 have been fully considered but they are not persuasive. Applicant argues that Smither et al. do not teach or suggest either a means for producing a fluid jet or for forming a focus of a radiation beam on a fluid jet. Applicant also provides a definition of a jet as "A strong, well-defined stream of compressible fluid, either gas or liquid, issuing from an orifice or nozzle or moving in a contracted duct." It is also stated that on page 1, second paragraph of the disclosure, there is given an example of how a fluid jet can be formed, where it is stated that a fluid

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such as water is ejected under a high pressure. Smither et al. do disclose a stream of gallium flowing across the surface of an anode (column 4, lines 7-10), as noted by the applicant. However, Smither et al. also disclose (column 4, lines 26-30) a preferred embodiment in which "the liquid gallium 16 flows at a velocity measured at the distribution head 22 of 200 cm per sec. With the distribution head 22 having a cross-section of 0.2 cm^2 , the liquid gallium 16 flows at a rate of 40 cc per sec." This defines "a strong, well-defined stream of liquid, issuing from an orifice or nozzle or moving in a contracted duct", fulfilling the requirements of "jet" as defined by applicant. An internet definition of "jet" is given by:

jet²  Pronunciation Key (jet)
n.

1.
 - a. A high-velocity fluid stream forced under pressure out of a small-diameter opening or nozzle.
 - b. An outlet, such as a nozzle, used for emitting such a stream.
 - c. Something emitted in or as if in a high-velocity fluid stream: "such myriad and such vivid jets of images" (Henry Roth).
2.
 - a. A jet-propelled vehicle, especially a jet-propelled aircraft.
 - b. A jet engine.

Smither et al. disclose, as quoted above in column 4, lines 26-30, a high-velocity fluid stream forced under pressure out of a small-diameter opening or nozzle. Smither et al. also disclose a gallium pump (26) which returns the liquid gallium under pressure. Thus, Smither et al. disclose a fluid jet.

Conclusion

11. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

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TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jurie Yun whose telephone number is 571 272-2497.

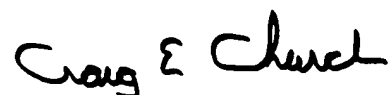
The examiner can normally be reached on Monday-Friday 8:30-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on 571 272-2490. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Jurie Yun
October 28, 2004



Craig E. Church
Primary Examiner